

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF THE CLAIMS

1. (currently amended) A method for inspecting attributes of containers useful in a system having at least one sensing means and a source of non-visible electromagnetic radiation, the method comprising steps of:

selectively adding optical absorbing compounds acting in the non-visible wavelength range to a plurality of polymer layers;

forming a container having the plurality of polymer layers, each polymer layer being formulated to perform a different set of container-related functions;

disposing the container between the sensing means and the source of non-visible near-IR electromagnetic radiation;

activating the source to generate non-visible electromagnetic radiation;

sensing the non-visible electromagnetic radiation by the sensing means; and,

determining the attributes of individual layers of the container based on the sensing.

2. (original) The method of claim 1 further comprising determining a state, quality, or acceptability of the container based on sensing and determining.

3. (original) The method of claim 2 further comprising one of rejecting and marking for subsequent action the container based on the state, quality or acceptability of the container.

4. (previously presented) A machine vision apparatus comprising:
a sensor device comprising an array of photosensitive elements operative to be sensitive to radiation within the non-visible portion of the electromagnetic spectrum;

a source of electromagnetic radiation wherein a portion of an emitted spectrum thereof is within the non-visible portion of the electromagnetic spectrum;

part detection, tracking, and conveyance means operative to interact with multi-layer containers under test and maneuver the containers into an advantageous position between the sensor device and source and to provide instrument control signals to both the sensor device and source;

a processing means which receives output of the sensor device and executes processing operations to analyze attributes of individual layers of the container based on a presence of selectively absorptive dyes, within selected layers, acting in the non-visible portion of the electromagnetic spectrum; and,

a means which receives the processed output of the processing means and acts to facilitate one of rejecting and marking for subsequent action the container based on the attributes analyzed.

5. (original) The apparatus of claim 4 wherein the source comprises an array of LED emitters.

6. (original) The apparatus of claim 5 wherein the LED emitters are pulsed.

7. (previously presented) The method as set forth in claim 1 wherein the forming comprises forming the container with at least a first layer and a second layer.

8. (previously presented) The method as set forth in claim 7 wherein the first layer has a first spectral absorption range and the second layer has a second spectral absorption range.

9. (previously presented) The method as set forth in claim 1 wherein the determining comprises determining the attributes for each layer simultaneously.

10. (previously presented) The method as set forth in claim 1 wherein the attributes comprise at least one of existence, thickness and integrity.

11. (previously presented) The apparatus as set forth in claim 4 wherein the containers under test include at least a first layer and a second layer.

12. (previously presented) The apparatus as set forth in claim 11 wherein the first layer has a first spectral absorption range and the second layer has a second spectral absorption range.

13. (previously presented) The apparatus as set forth in claim 4 wherein the processing means is operative to receive the output of the sensor device and execute the processing operations for layers simultaneously.

14. (previously presented) The apparatus as set forth in claim 4 wherein the attributes comprise at least one of existence, thickness and integrity.

15. (previously presented) A system for inspecting attributes of an item, the item having a plurality of polymer layers, individual polymer layers being formulated to perform a different set of functions and at least one layer including an optical absorbing compound acting in the non-visible wavelength range, the system comprising:

- means for generating non-visible electromagnetic radiation;
- means for sensing the non-visible electromagnetic radiation;
- means for disposing the item between the sensing means and the generating means; and,
- means for determining attributes of individual layers of the item.

16. (previously presented) The system as set forth in claim 15 further comprising a means for determining a state, quality or acceptability of the container based on output from the means for sensing and the means for determining.

17. (previously presented) The system as set forth in claim 16 further comprising means for rejecting and marking for subsequent action the item based on the state, quality or acceptability of the container.

18. (previously presented) The system as set forth in claim 15 wherein the means for determining comprises means for determining the attributes for each layer simultaneously.

19. (previously presented) The system as set forth in claim 15 wherein the attributes comprise at least one of existence, thickness and integrity.

20. (previously presented) The system as set forth in claim 15 wherein the item comprises at least a first layer having a first spectral absorption range and a second layer having a second spectral absorption range.

21. (previously presented) The method as set forth in claim 1 wherein the non-visible electromagnetic radiation is near IR radiation and the non-visible wavelength range is near IR wavelength range.

22. (previously presented) The apparatus as set forth in claim 4 wherein the non-visible portion of the electromagnetic portion is the near IR portion of the electromagnetic spectrum.

23. (previously presented) The system as set forth in claim 15 wherein the non-visible wavelength range is the near IR wavelength range and the non-visible electromagnetic radiation is near IR electromagnetic radiation.

24. (currently amended) A method for inspecting attributes of an item useful in a system having at least one sensing means and a source of non-visible electromagnetic radiation, the method comprising steps of:

forming the item having a plurality of layers, wherein at least one individual layer has a unique spectral absorption curve relative to other layers;

disposing the item between the sensing means and the source of non-visible near-IR electromagnetic radiation;

activating the source to generate non-visible electromagnetic radiation;

sensing the non-visible electromagnetic radiation by the sensing means; and,

determining the attributes of individual layers of the item based on the sensing.